

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization  
International Bureau



(43) International Publication Date  
7 August 2003 (07.08.2003)

PCT

(10) International Publication Number  
**WO 03/065394 A2**

(51) International Patent Classification<sup>7</sup>: **H01G 9/20**

(21) International Application Number: **PCT/US03/02355**

(22) International Filing Date: 24 January 2003 (24.01.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:

10/057,394	25 January 2002 (25.01.2002)	US
60/351,691	25 January 2002 (25.01.2002)	US
60/368,832	29 March 2002 (29.03.2002)	US
60/400,289	31 July 2002 (31.07.2002)	US

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(81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW.

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(84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— without international search report and to be republished upon receipt of that report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

**WO 03/065394 A2**

(54) Title: PHOTOVOLTAIC CELL COMPONENTS AND MATERIALS

(57) Abstract: A polymeric linking agent enables the manufacture of photovoltaic cells at low temperatures (< about 300 °C) on flexible substrates, including, for example, polymeric substrates. Photovoltaic cells may be fabricated by a relatively simple continuous manufacturing process, for example, a roll-to-roll process, instead of a batch process. Processes and compositions that cause the gelling of liquid electrolytes at relatively low temperatures also facilitate the fabrication of flexible photovoltaic cells. Methods and chemical structures that improve the adhesion of a photovoltaic material to the substrates and that produce mechanically stable nanoparticle formulations are also described. Furthermore, co-sensitizers that co-adsorb with a sensitizing dye to the surface of an interconnected semiconductor oxide nanoparticle material increase the efficiency of photovoltaic cells by improving their charge transfer efficiency and reducing the back transfer of electrons from the interconnected semiconductor oxide nanoparticle material to the sensitizing dye.